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Vaginal Stenosis After Cervical Cancer Treatments: Challenges for Reconstructive Surgery

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Cervical cancer is one of the most frequent gynecological malignancies, and its incidence is strictly related to the adequate implementation of screening programs and human papillomavirus vaccination [1]. These factors, together with the identification of novel potential tumor markers of uterine cervical cancer [2], are able to dramatically change the epidemiology of the disease. Nevertheless, when primary and secondary preventive strategies fail, radical or modified-radical hysterectomy with appropriate lymph node assessment represent the primary treatment for cervical cancer in case of operable patients without desire of fertility preservation [3]. Surgery, with or without the identification of sentinel lymph node mapping [4], is usually followed by adjuvant external beam radiotherapy with or without chemotherapy and vaginal brachytherapy, based on the stage and the pathological risk factors [3].

Compared to other gynecologic malignancies, cervical cancer usually affects young women with the majority of cases diagnosed before 50 years of age, and early diagnosis and appropriate treatment allow to achieve a long-term survival in the majority of patients [1]. Therefore, if on the one hand surgery and adjuvant radio and chemotherapy are able to be curative in the majority of cases at early stage, on the other hand the young age of affected women determines the exposure of patients to the long-term consequences of treatments, affecting health and different aspects of the quality of life [5]. The long-term quality of life can be disrupted by urinary, gastrointestinal, neurologic, reproductive, and sexual side effects primarily related to surgery and radiotherapy [5].

Both radical surgery and radiotherapy are able to determine medium and long-term consequences on the sexual functions of cervical cancer survivors, who are particularly exposed due to the young age. Noteworthy, the effects of surgery and radiotherapy on sexual life are different. Although the impact of surgery worsens with the increase of radicality, in general sexual satisfaction and sexual activity drop immediately after surgery but return almost to the pre-surgical level in one year [5]. Conversely, women who underwent adjuvant radiotherapy reported worst symptoms with a higher risk of vaginal shortening and stenosis, vaginal

dryness, bleeding, and dyspareunia. The reports about the long-term effects of radiotherapy on sexual function are conflicting but, based on different factors, the radiotherapy is related to a higher risk of persistent sexual dysfunction [5]. One of the main consequences of radiotherapy, and specifically of brachytherapy, is the risk of vaginal stenosis that can severely affect and limit sexual life. On that basis, vaginal dilator during radiotherapy and early restoring of sexual activity after treatment are recommended, although there is limited evidence showing that regular vaginal dilation during radiotherapy prevents stenosis or improves quality of life [6]. Therefore, although there are different factors influencing the risk of vaginal shortening and stenosis, it can occur, and the treatment can be challenging and can require significant reconstructive surgery.

A neovagina reconstruction can be the only option when the vaginal stenosis is severe. Nevertheless, although different techniques have been developed and proposed for neovagina reconstruction in case of vaginal congenital atresia or male-to-female transition [7], the reconstruction of neovagina in women underwent radiotherapy with vaginal stenosis is more challenging because the radiotherapy causes a fibrosis of the pelvic tissue with compromised vascularization and reduced elasticity [8]. Therefore, techniques based on vascular pedicles were usually recommended in these patients, although series of neovagina reconstruction using a skin graft were reported [8]. The adoption of a graft with vascular pedicle is usually favored because it allows the transposition in the fibrotic pelvis of a healthy tissue with appropriate vascularization that should favor healing and reduce complications [9]. In this scenario, the recently published study “Use of vaginal reconstructive surgery in cervical cancer patients to prevent vaginal stump contracture” highlights the role of the ileal graft with vascular pedicle as a technique able to reconstruct the vagina in case of severe vaginal stenosis after treatments for cervical cancer [10].

The technique consists in the transposition of an isolated ileal segment and related vascular pedicle in the pelvis, between the rectum and bladder; it was originally developed by Baldwin to create a neovagina in case of congenital

atresia and became one of the most preferred options [8]. Nevertheless, although its extensive use, the adoption of this technique in patients with vaginal stenosis and pelvic fibrosis due to radiotherapy was supported by few pieces of evidence so far. On that basis, the results of the present study are important to reinforce the use of this technique as possible solution to improve the quality of life even in cervical cancer survivors. The authors reports the ileal graft with vascular pedicle as feasible and effective to provide satisfactory results in women underwent radical surgery and radiotherapy for cervical cancer, with limited surgical complications and an overall sexual satisfaction of the patients after 2 years of follow-up [10].

In general, this evidence is consistent with the available literature reporting the vaginoplasty with bowel segment as a safe and effective procedure for the creation of a neovagina. The use of vaginoplasty with bowel segment is supported because as compared to other techniques based on vascular pedicles, the ileal graft may be simpler and may require less skill to be performed. Additionally, the ileal graft has more elasticity as compared to flap grafts, allowing a shorter period of stent placement as well as the possibility to achieve a satisfactory size by persistent dilatation. Nevertheless, intestinal occlusion, anastomosis stenosis, and rectovaginal fistula are possible complications, and the use of a stent and early start of regular sexual intercourse are in any case mandatory to avoid the potential neovagina stenosis.

In summary, with the improvement of cancer treatment the number of patients who face the long-term consequences of surgery, chemotherapy, and radiotherapy increases, and this is particular evident in young patients such as women treated for cervical cancer. In these young women, the potential disruption of vaginal anatomy by radical surgery and radiotherapy can cause severe long-term consequences on sexual life and on the general quality of life. On that basis, the appropriate management of these women is not limited to the cancer treatment but extends to the prevention and treatment of the long-term side effects. In case of vaginal stenosis, the reconstruction of a neovagina can be required, and the ileal graft with vascular pedicle may be adopted to achieve satisfactory results [10], although a gold standard technique is not defined, and further investigations are mandatory.

Disclosure statement

The authors have no proprietary, financial, professional or other personal interest of any nature in any product, service or company. The authors alone are responsible for the content and writing of the paper.

Authors' contribution

All the authors conform the JOURNAL and the International Committee of Medical Journal Editors (ICMJE) criteria for authorship contributed to the intellectual content of the study and gave approval for the final version of the article. H.B.F and D.L. screened literature and retrieved the most relevant data about the topic; R.R. performed critical appraisal of the article titled "Use of vaginal reconstructive surgery in cervical cancer patients to prevent vaginal stump contracture"; S.G. and A.S.L. wrote the manuscript; M.F. edited, revised and gave approval for the final version of the manuscript.

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